

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
CERTIFICATE OF WAIVER

ISSUED TO

Frontier Precision UAS
Responsible Person: Austin Rains
Waiver Number: 107W-2024-00195

ADDRESS –

5480 W 60th Ave Unit A
Arvada, CO 80003

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the provisions contained in this certificate.

OPERATIONS AUTHORIZED

Small unmanned aircraft system (sUAS) operations beyond the visual line of sight of the remote pilot in command (PIC); Small unmanned aircraft system (sUAS) operations in which a participating Visual Observer (VO) is not able to see the unmanned aircraft.

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

**14 CFR §§ 107.31—Visual line of sight aircraft operation, and
107.33(b) & (c)(2)—Visual observer**

STANDARD PROVISIONS

1. A copy of the application made for this certificate shall be attached to and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Administrator of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

NOTE—This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

SPECIAL PROVISIONS

Special Provisions Nos. 1 to 45, inclusive, are set forth on the attached pages.

This Certificate of Waiver is effective from April 16, 2024, to December 31, 2025, and is subject to cancellation at any time upon notice by the Administrator or an authorized representative.

BY DIRECTION OF THE ADMINISTRATOR

Emerging Technologies Division, AFS-700

SPECIAL PROVISIONS ISSUED TO Frontier Precision UAS

General.

This Certificate of Waiver is an amendment which supersedes and replaces Waiver 107W-2022-02821 issued to Frontier Precision UAS for operations under 14 CFR 107. Waiver 107W-2022-02821 is no longer valid.

The FAA's Flight Standards Service has reviewed your application to ensure compliance with the requirements of 14 CFR § 107.200 and § 107.205. Pursuant to these authorities, the Administrator finds that the proposed small unmanned aircraft (sUA) operation can be conducted safely under the provisions of this Certificate of Waiver (Waiver) as listed below because you have established adequate mitigations for risks involved with operating your sUA in the manner you described. Adherence to the provisions of this Waiver establishes the required level of safety within the national airspace system.

The Administrator may cancel this Waiver at any time. As a general rule, this Waiver may be canceled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with any provision listed below is a violation of the terms of this Waiver and will serve as justification for cancellation.

List of Regulations Waived by Section and Title. The following regulations are waived:

14 CFR § 107.31, Visual line of sight aircraft operation, is waived to allow operation of the small unmanned aircraft (sUA) beyond the direct visual line of sight of the remote pilot in command (PIC);

14 CFR § 107.33(b) & (c)(2), Visual observer, is waived to the extent necessary to allow operation of the small unmanned aircraft (sUA) when any Visual Observer (VO) who is participating in the operation may not be able see the unmanned aircraft in the manner specified in § 107.31.

No part of this waiver will function as an airspace authorization under 14 CFR § 107.41. The FAA's Air Traffic Organization responds directly to requests for such authorizations. The FAA LAANC system cannot be used for waived operations.

Common Special Provisions. The Responsible Person is directly responsible for safety of operations conducted under this Waiver and will ensure the Remote Pilot in Command (remote PIC), manipulator of the controls, and visual observer(s) (VO)¹ comply with all provisions of this Waiver.

1. The Responsible Person listed on the Waiver is responsible to the FAA for the safe conduct of the operations. Prior to conducting operations that are the subject of this Waiver, the Responsible Person:
 - a. Must ensure the remote PIC, manipulators of the controls, and VO(s) are informed of the terms and provisions of this Waiver and strictly observe the terms and provisions herein;
 - b. Must ensure the remote PIC, manipulators of the controls, and VO(s) are informed and familiar with part 107 regulations; and

¹ Title 14 CFR § 107.3 defines the term "visual observer." Any VO participating in operations conducted under this Waiver must meet the requirements listed in § 107.33 throughout the duration of flight operations.

- c. Evidence of the above (a and b) must be documented and must be presented for inspection upon request from the Administrator or an authorized representative;
2. This Waiver may not be combined with any other waiver(s), authorizations(s), or exemption(s) without specific authorization from the FAA;
3. The FAA has the authority to cancel or delay any or all flight operations if the safety of persons or property on the ground or in the air are in jeopardy or there is a violation of the terms of this Waiver;
4. A copy of this Waiver must be accessible and available to the remote PIC at the ground control station during sUA operations that are the subject of this Waiver;
5. The Responsible Person listed on this Waiver must maintain a current list of pilots by name and remote pilot certificate number used in operations under this Waiver. This list must be presented for inspection upon request from the Administrator or an authorized representative;
6. The Responsible Person listed on this Waiver must maintain a current list of sUA by registration number(s) used in operations under this Waiver. This list must be presented for inspection upon request from the Administrator or an authorized representative;
7. For the purposes of this Waiver, direct participants are the remote PICs, persons manipulating the controls, VOs, and any persons whose involvement is necessary for safety of the sUA operation. All other persons are considered non-participants;

Waiver Specific Special Provisions The remote PIC and Visual Observer (VO) may conduct sUAS operations without the ability to see the unmanned aircraft throughout the entire flight, provided:

OPERATIONAL PROVISIONS

8. Operations may not be conducted at night or civil twilight as defined by 14 CFR Part § 1.1 and 107.29(c) respectively;
9. Prior to conducting operations under this Waiver, the remote PIC must perform and document the Area Selection Analysis as detailed in CONOPs Section 2.4 and identify operational area obstacles and boundaries so as to avoid collision with, or damage to property. Records of this ASA must be maintained and provided to the Administrator on request;
10. The area of operation must be safeguarded as described in the waiver application;
11. Geofencing must be used to confine the Operational Volume;
12. The remote PIC must ensure that routes are preplanned prior to flight (Waypoints) and aircraft are programmed to automatically follow the route;
13. The remote PIC must be located within the defined Operational Area;
14. Launch or recovery areas must be pre-designated and monitored to keep any human being who is not directly participating in the operation out of the areas prior to, during, and immediately following flight operations;

15. Return to Home/Return to Land feature must not allow the sUA to deviate from the defined operational volume;
16. Road crossings must be executed to reduce time over roadways and Electronic Observers added as detailed in the submitted Waiver application. Operations over moving vehicles are prohibited;
17. The Detect and Avoid (DAA) system(s) described in the Application Package must be functioning and observed during all operations conducted under this waiver;
18. The Responsible Person must ensure a Coordination Agreement exists between the operator(s) of the sUA and any airport, heliport, known agricultural aerial application operation or aerial military installation within a 2-mile radius of the operating area and abide by the stipulations of the agreement;
19. The remote PIC may not program or conduct a flight operation beyond the segment length / payload configuration detailed in the Waiver application;
20. SHIELDED OPERATIONS
 - a. The sUA must not exceed;
 - i. 100 feet above ground level (AGL), or
 - ii. 100 feet above the height of any object, obstacle (natural or man-made) within a 200 foot radius of the sUA perpendicular to the sUA's direction of flight (lateral separation), and
 - iii. 100 feet above the height of any object, obstacle (natural or man-made) within a 500 foot radius of the sUA along the sUA's direction of flight (vertical separation), and
 - iv. not to exceed 400 feet AGL
21. NON-SHIELDED OPERATIONS
 - a. The sUA must not exceed 400 feet AGL
 - b. Non-Shielded Operations must use one or more VO as described in the Waiver application;
 - c. The remote PIC must ensure sufficient VO(s) are used to identify any non-participating aircraft prior to their entry into the planned operational area. For the purpose of this Waiver, sufficient VO(s) is defined as the minimum number of VO(s) required to continuously observe at least a 2 statute mile radius of airspace surrounding the sUA in flight. The remote PIC must confirm VO(s) are physically located such that the remote PIC receives sufficient notice to ensure the UA remains well clear of all other aircraft;
 - d. Communication between the remote PIC and VO must occur to facilitate, when necessary, the remote PIC taking action to maneuver the sUA with sufficient time to:
 - i. Give way to all other aircraft in accordance with § 107.37,
 - ii. React to any unforeseen operational or mechanical failure without creating a hazard to other people, other aircraft, or property in the event of a loss of control of the sUA, and
 - iii. Maintain compliance with this Waiver and un-waived provisions of part 107
22. The sUA must be equipped with lighted anti-collision lighting visible from other aircraft at a distance of no less than 1 statute miles;
23. Individuals directly participating in the operation of the sUAS must be easily identifiable visually (e.g., apparel, safety vests);

24. The Responsible Person must ensure all operations conducted under this Waiver follow the procedures outlined in the waiver application. If a discrepancy exists between the provisions in this Waiver and the procedures outlined in the Waiver application, the Waiver takes precedence and must be followed;
25. The Responsible Person must ensure a copy of the Waiver application and Waiver is available to the remote PIC and all other direct participants prior to and during sUAS operations that are the subject of this Waiver;
26. The Responsible Person must ensure a copy of the current operations manual is available to the remote PIC and all other direct participants prior to and during sUAS operations that are the subject of this Waiver;
27. The Responsible Person must ensure all operations conducted under this Waiver follow the procedures outlined in the current operations manual (submitted as Revision 2.1 dated April 1, 2024). If a discrepancy exists between the provisions in this Waiver and the procedures outlined in the operations manual, the provisions of this Waiver take precedence and must be followed;
28. The Responsible Person may update or revise the operations manual. The Responsible Person must track such revisions and present revised documents to the Administrator or an authorized representative upon request. The Responsible Person must also present revised documents when applying for extension of or amendment to this Waiver. If any revision to the manual would be contrary to the information provided in the waiver application or obviate a condition or limitation of this waiver, then the Responsible Person must apply for an amendment to this Waiver;
29. The Responsible Person must ensure each remote PIC who will conduct operations under this Waiver is trained in a manner that addresses the items listed in § 107.49(a)-(e) and in a manner that is consistent with how the sUAS will be operated under this Waiver. All training and demonstration for all remote PICs and VOs must be documented and made available upon request by the Administrator or an authorized representative. Training operations may only be conducted under the standard requirements of part 107 (without waiver). The training must include:
 - a. sUA limitations,
 - b. sUA programming,
 - c. sUA operational procedures,
 - d. Abnormal procedures,
 - e. Air traffic avoidance procedures,
 - f. Crew Resource Management,
 - g. sUA flight training, and
 - h. Demonstration of sUA ground and flight skills;

30. Prior to operations under this Waiver, all Direct Participants must attend a safety briefing that addresses, at minimum, the following items as applicable:
 - a. Designated positions, physical locations, responsibilities, and Crew Resource Management,
 - b. Planned flight operating area,
 - c. Designated launch and recovery areas,
 - d. Verification of geo-fence boundaries,
 - e. Verification of return home and land flight profile, and course,
 - f. Procedures for avoidance of other aircraft and obstacles,
 - g. Procedures for operating under this waiver,
 - h. Land vehicle speed,
 - i. Intended flight path,
 - j. Abnormal procedures, and
 - k. Emergency procedures;
31. Operations subject to this waiver must cease as soon as possible in a manner that does not jeopardize the safety of human beings, property or other aircraft, if, at any time:
 - a. Safety of human beings or property on the ground or in the air is in jeopardy,
 - b. Any failure to comply with the provisions of this Waiver exists,
 - c. Full-duplex communications cannot be maintained between the remote PIC and any VO participating in the operation,
 - d. A non-participating aircraft enters the designated flight operating area,
 - e. GPS signal is lost, or
 - f. GPS location information is degraded;
32. No sUA flight that occurs under this waiver may carry the property of another for compensation or hire;
33. The Responsible Person must file a Notice to Air Mission (NOTAM) no more than 72 hours and no less than 24 hours prior to operating under this waiver. A NOTAM can be filed by calling 1-877-487-6867 (1-877-4-US-NTMS). The Responsible Person must verify the NOTAM has been issued prior to conducting waived operations;

TECHNICAL PROVISIONS

34. Operations conducted under this Waiver may only occur with the make and model sUAS described in the waiver application. Proposed operations of any other manufacturer, make or model of sUAS will require a new waiver application or a request to amend this Waiver;
35. All sUAS operations conducted in accordance with this Waiver must comply with all manufacturer recommendations and limitations for the sUAS;
36. The Responsible Person must maintain each sUAS and its components in accordance with manufacturer's instructions and recommendations. sUAS maintenance includes scheduled and unscheduled overhaul, repair, inspection, modification, replacement, and system software upgrades of the sUAS and its components necessary for flight. A log of all maintenance performed must be kept for each aircraft operated under this waiver. This log must be available to the remote PIC for review prior to conducting operations that are the subject of this waiver. Each sUAS maintenance log must be presented to the Administrator when requested. The log must contain the following information for each maintenance activity:
 - a. A description (or reference data acceptable to the Administrator) of work performed,
 - b. The date of completion of the work performed,
 - c. The name of the person who performed the work, and
 - d. The signature of the person who performed the work;
37. Any sUAS that has undergone maintenance must undergo a functional test flight prior to conducting operations under this Waiver. A log entry must be made for each functional test flight. The log entry must contain at minimum the:
 - a. Calendar date,
 - b. sUA registration number,
 - c. Remote PIC who performed the functional test flight,
 - d. Duration of the flight, and
 - e. The result of the functional flight test;
38. A functional test flight may only be conducted under the standard requirements of part 107 (without waiver);
39. The sUAS ground control station must display in real-time the sUA altitude, position, direction of flight, and sUA flight mode, and be configured to audibly or visually alert the remote PIC of degraded system performance and loss of Control link with the sUA. This information must be available at all times to the remote PIC;
40. The sUAS must audibly and visually alert the remote PIC of degraded system performance, sUAS malfunction, or loss of Command and Control (C2) link between the ground control station and the sUA
41. ADS-B out (1090/978 MHz) may not be transmitted from the sUAS when operating pursuant to this Waiver. ADS-B in must be operational during all operations pursuant to this Waiver;
42. Prior to conducting operations under this Waiver, the remote PIC must determine all control links used in the sUAS, will maintain the ability to control the sUA at the maximum planned distance for the proposed operation. At all times during operations that are the subject of this Waiver, the remote PIC must maintain the ability to direct the sUA to ensure compliance with the applicable provisions of this waiver;

43. If the remote PIC loses command or control link with the sUA, the sUA must follow the loss of command and control procedure as described in the waiver application;
44. All emitters used in sUAS must be in compliance with all applicable FCC regulations and all provisions of the FCC authorization granted for the emitter. An FCC experimental authorization may not be used for sUAS operations under this Waiver; and

ENVIRONMENTAL PROVISIONS

45. Operations conducted under this waiver are limited to the locations meeting the Performance-Based Operations Site Selection Process as submitted in the application of this Waiver.